

PATENT COOPERATION TREATY

TRANSLATION

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

To:

Date of mailing (day/month/year) **See form PCT/ISA/210**

Applicant's or agent's file reference
SCG5305PT-WO

FOR FURTHER ACTION

See paragraph 2 below

International application No.
PCT/EP2004/013568

International filing date (day/month/year)
30.11.2004

Priority date (day/month/year)
22.12.2003

International Patent Classification (IPC) or both national classification and IPC:
C30B9/00, C30B9/12, C30B29/46, C30B29/60, H01L31/032

Applicant
SCHEUTEN GLASGROEP

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(h) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/EP

Authorized officer

Facsimile No.

Telephone No.

WRITTEN OPINION OF THE
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International application No.

PCT/EP2004/013568

Box No. 1 Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This opinion has been established on the basis of a translation from the original language into the following language
_____, which is the language of a translation furnished for the purposes of international search (under Rule 12.3 and 23.1(b)).

2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

- ☐ a sequence listing
☐ table(s) related to the sequence listing

b. format of material

- ☐ in written format
☐ in computer readable form

c. time of filing/furnishing

- ☐ contained in the international application as filed.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

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Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims <u>1 - 5</u>	YES
	Claims _____	NO
Inventive step (IS)	Claims <u>1 - 5</u>	YES
	Claims _____	NO
Industrial applicability (IA)	Claims <u>1 - 5</u>	YES
	Claims _____	NO

2. Citations and explanations:

1 Reference is made to the following documents:

D1: US 6 488 770 B1 (MEISSNER DIETER ET AL)

3 December 2002 (2002-12-03)

D2: ALTOSAAR M ET AL: "Monograin layer solar cells" PREPARATION AND CHARACTERIZATION, ELSEVIER SEQUOIA, NL, vol. 431-432, 1 May 2003 (2003-05-01), pages 466-469, XP004428688 ISSN: 0040-6090

D3: EP-A-0 828 299 (MATSUSHITA ELECTRIC IND CO LTD) 11 March 1998 (1998-03-11)

2 Document D1 discloses (cf. the references in the search report) a process from which the subject matter of claim 1 differs in that NaCl is used as the flux instead of KI or NaI.

3 Document D2 discloses (cf. the references in the search report) a process from which the subject matter of claim 1 differs in that KCN is used as the flux instead of KI or NaI.

4 Document D3 (cf. the references in the search report) describes the advantages of a

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Box No. V

Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability;
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substoichiometric fraction of Cu, but the preparation of a powder consisting of a Cu(In, Ga)Se₂ compound is not disclosed.

- 5 The subject matter of claim 1 is thus novel (PCT Article 33(2)). Document D1 is considered to be the closest prior art. The teaching of D1 differs from the process of claim 1 only in that NaCl is replaced by KI or NaI. However, these three salts are all alkali metal halides. This different technical feature has, though, a surprising effect on the specific resistance of the powder. According to the description, page 7 of the application, it is 10 kOhm.cm to 2 MOhm.cm, which is significantly higher in comparison to the specific resistance of the powder prepared according to the process of D1 (0.1 to 0.6 Ohm.cm). The subject matter of claim 1 can therefore be considered to be inventive.
- 6 Claims 2-4 are dependent upon claim 1 and therefore likewise meet the PCT requirements for novelty and inventive step.
- 7 The subject matter of claim 5 is a monograin membrane solar cell which comprises a powder prepared by a process according to one or more of claims 1 to 4. Because this powder can be considered to be novel and inventive, the solar cell of claim 5 is also novel and inventive.